DETAILED ACTION

Introduction

1. This action is responses in the amendment filed on 01-12-2010. Claims 1-16 and 18, 21 have been cancelled and claims 17, 22, 23, 33 and 35 have been amended. Claims 17 and 19, 20, 22-35 are pending.

Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3 Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) in view of "Selected Topics in Surface Electromyography for Use in the Occupational Setting: Expert Perspectives", U.S. Department of Health and Human Services, 1992, CDC (Publication No. 91-100) (hereafter as CDC).

Consider claim 19 Burnett teaches a method for detecting sounds generated by a first person which are non-audible to a second person(communication by cellular telephone and see col. 1 line 35-47) , comprising:

attaching a microphone on a surface of skin over a muscle below a mastoid of the first person(reads on back of neck, and see col.5 line 15-25 and fig.7)); and generating an electrical signal from the microphone corresponding to vibrations non-audible to the second person(communication by cellular telephone and see col. 1 line 35-47), which

are generated by the first person and conducted through the skin(see figs.2, 7 and col. 2 line41-col. 4 line 13); but Burnett does not explicitly teach the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person. Burnett teaches the positioning structure positioning the sensor on back of the neck where speech production can be detected.

However, CDC teaches generating an electrical signal from the microphone (see fig. 1-1(EMG)) corresponding to vibrations non-audible to the second person, which are generated by the first person, the vibrations being transmitted through flesh of the first person to the sternocleidomastoid muscle and conducted through the skin(see figs 3-5 (B, C), figs 7-5, 7-6 and pages 12-14, page 24-26, pages 35-36).

Since, Burnett does not limited what the positioning structure positioning the microphone on a surface of skin have to be, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the invention of Burnett by implementing a particular arrangement (such as, the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the first person) as claimed based on the designer's reference and needs for the purpose of acquiring the desired audio sound quality of the output signal to the listener in the acoustical environment.

4 Claims 17, 20, 23 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) in view of Saltzman (US PAT. 4,777,961) and "Selected Topics in Surface Electromyography for Use in the

Occupational Setting: Expert Perspectives", U.S. Department of Health and Human Services, 1992, CDC (Publication No. 91-100) (hereafter as CDC).

Consider claim 17 Burnett teaches a communication device for sampling sounds generated by a first person which are non-audible to a second person(communication by cellular telephone and see col. 1 line 35-47), the communication device comprising: a microphone (see fig.2 (10)); and a positioning the microphone on a surface of skin over a muscle below a mastoid of the first person (reads on back of neck, and see col.5 line 15-25) so as to detect vibrations non-audible to the second person(communication by cellular telephone and see col. 1 line 35-47), which are transmitted through flesh of the first person to the skin and conducted through the skin (see fig.7 and col. 2 line 41-col. 4 line 13); but Burnett does not explicitly teach a stethoscope-type microphone, and a synthetic resin sucker, and positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person. Burnett teaches the positioning structure positioning the sensor on back of the neck where speech production can be detected.

However, Saltzman teaches a stethoscope-type microphone (see fig. 2B) having a capacitor microphone (14), a diaphragm(15, contact surface, fig.3), and a synthetic resin sucker(reads on 8' with flexible material), the diaphragm being attached on a surface of skin over a body(see figs 1-3 and col. 3 line 56-col. 4 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Saltzman into Burnett to provide the microphone to locating in different place for more security.

On the other hand, CDC teaches a positioning structure coupled to the microphone(see fig. 1-1(EMG)), the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the first person so as to detect vibrations non-audible to the second person, which are transmitted through flesh of the first person to the sternocleidomastoid muscle and conducted through the skin (see figs 3-5 (B, C), figs 7-5, 7-6 and pages 12-14, page 24-26, pages 35-36).

Since, Burnett does not limit what the positioning structure positioning the microphone on a surface of skin have to be, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Burnett by implementing a particular arrangement (such as, the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the first person) as claimed based on the designer's reference and needs for the purpose of acquiring the desired audio sound quality of the output signal to the listener in the acoustical environment.

Consider claim 35 Burnett teaches a signal processing apparatus (see figs. 1-7) that processes a signal sampled through the communication device according to claim 17(see above claim 17 rejection).

Consider claim 23 Burnett teaches a communication interface system comprising the communication device and a signal processing apparatus that processes a signal sampled through the communication device, wherein a result of processing by the

signal processing apparatus is used for communications (see figs.1-7 and col. 2 line 41-col. 4 line 13 (see above claim 17 rejection).

Consider claim 20 Burnett teaches the sounds include a murmur and a respiratory sound (see figs.2, 7 and col. 2 line41-col. 4 line 13 and col. 5 lines 15-25).

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) as modified by Salzmann (US PAT. 4,777,961) and "Selected Topics in Surface Electromyography for Use in the Occupational Setting: Expert Perspectives", U.S. Department of Health and Human Services, 1992 CDC (Publication No. 91-100) (here after CDC) as applied to claim 17 above, and further in view of Iwata (US PAT. 4,654,883).

Consider claim 22 Burnett as modified by Saltzman and CDC does not explicitly teach the communication device comprising a diaphragm installed on the surface of the skin and a sucker that sticks to the diaphragm; and the microphone which is integrated with a head-installed object such as glasses, a headphone, a supra- aural earphone, a cap, or a helmet which is installed on the human head of the first person.

However, Iwata teaches that the communication device comprises a diaphragm (see fig.3, (22)) installed on the surface of the skin and a sucker that sticks to the diaphragm (see col. 3 line 30-56) and the microphone (see fig.1, (17)) is integrated with a head-installed object such as glasses, a headphone, a supra-aural earphone, a cap, or a helmet which is installed on the human head of the first person(see fig.2 and see col. 3 line 30-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Iwata into Burnett , Saltzman and CDC to provide more accurate speech recognition.

6. Claims 24-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) as modified by Saltzman (US PAT. 4,777,961) and "Selected Topics in Surface Electromyography for Use in the Occupational Setting: Expert Perspectives", U.S. Department of Health and Human Services, 1992 CDC (Publication No. 91-100) (hereafter as CDC) as applied to claim 17 above, and further in of Holzrichter (US PAT. 5,729,694).

Consider claim 24 Burnett as modified by Saltzman and CDC does not explicitly teach the communication interface system, wherein the signal processing apparatus includes an analog digital converting section that quantizes a signal sampled through the microphone, a processor section that processes a result of the quantization by the analog digital converting section, and a transmission section that transmits a result of the processing by the processor section to an external apparatus.

However, Holzrichter teaches the communication interface system wherein the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone (see fig. 20, (91-93, EM sensor)), a processor section (90) that processes a result of the quantization by the analog digital converting section(see fig.5, 49 and col. 14 line

46-col. 15 line 67), and a transmission section that transmits a result of the processing by the processor section to an external apparatus (96 and see col. 56 line 35-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Holzrichter into Burnett , Saltzman and CDC to provide different configurations and control systems for the quality of the data collection, and sound unit parsing.

Consider claims 25-27, Holzrichter teaches the communication interface system wherein the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone and a transmission section that transmits a result of the quantization by the analog digital converting section to an external apparatus (see fig. 20, (96) and see col. 56 line 35-55) and in that the external apparatus processes (such as cellular) the result of the quantization (see col. 16 lines 51-67); and the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone (EM sensor), a processor section that processes a result of the quantization by the analog digital converting section, and a speech recognition section that executes a speech recognition process on a result of the processing by the processor section (see fig.8 and see col. 16 line 51-col. 17 line 18); and a transmission section that transmits a result of the speech recognition by the speech recognition section to an external apparatus(see fig.8 and see col. 16 line 51-col. 17 line 18).

Consider claim 28, Holzrichter teaches the communication interface system wherein an apparatus (see figs. 8 and 20) in a mobile telephone network executes a speech recognition process on the result of the processing by the processor section, the result being transmitted by the transmitting section(see col. 16 line 51-col. 17 line 18 and see col. 56 line 35-55).

Consider claims 29-31, Holzrichter teaches the signal processing executed by the signal processing apparatus is a modulating process in which the process section modulates the signal into sound audible to the second person(see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process applies a fundamental frequency of the vocal cords to the sound to convert the sounds into sounds as produced by regular vibration of the vocal cords, the converted sounds being audible to the second person(see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process converts a spectrum of the sound not involving the regular vibration of the vocal cords into a spectrum of sound as produced by the regular vibration of the vocal cords, the converted sounds being audible to the second person(see figs 4-7 and see col. 15 line 29-col. 16 line 50).

Consider claims 32-34, Holzrichter teaches that the communication interface system wherein the modulating process uses the spectrum of the sounds (see figs 14A-15B) speech recognition apparatus to recognize phonetic units such as syllables, semi-syllables, phonemes, two-juncture phonemes, and three-juncture phonemes and uses a speech synthesis technique to convert the recognized phonetic units into sounds as produced by regular vibration of the vocal cords, the sound being audible to the second

person (see figs. 4-7 and see col. 20 line 16-67); and input gain (see fig.5, (47)) is controlled (45) in accordance with a magnitude of a dynamic range of a sound sampled through the microphone (EM sensor and see col. 15 line 29-67); and the speech recognition section appropriately executes speech recognition utilizing an acoustic model of at least one of the sounds non-audible to the second person, a whisper which is audible but is uttered without regularly vibrating the vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur (see figs 9a-10b), and various sounds such as a teeth gnashing sound and a tongue clucking sound (see col. 6 line 45-col. 7 line 64 and col. 9 line 16-col. 10 line 68) .

Consider claims 30-34, Burnett teaches that the communication interface system wherein the modulating process applies a fundamental frequency of the vocal cords to the sounds to convert the sounds into sound as produced by the regular vibration of the vocal cords, the converted sounds being audible to the second person(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the modulating process converts a spectrum of the sounds not involving the regular vibration of the vocal cords into a spectrum of sound as produced by the regular vibration of the vocal cords, the converted sounds being audible to the second person(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the modulating process uses the spectrum of the sounds and a speech recognition apparatus to recognize phonetic units such as syllables, semi-syllables, phonemes, two-juncture phonemes, and three-juncture phonemes and uses a speech synthesis technique to convert the recognized phonetic units into sounds as produced

by regular vibration of the vocal cords, the sounds being audible to the second person(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system wherein an input gain is controlled in accordance with a magnitude of a dynamic range of a sound sampled through the microphone(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the speech recognition section appropriately executes speech recognition utilizing an acoustic model of at least one of the sounds non-audible to the second person, a whisper which is audible but is uttered without regularly vibrating vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur, and various sounds such as a teeth gnashing sound and a tongue clucking sound(see figs. 1-10 and col. 2 line 41-col. 4 line 13).

Response to Arguments

7. Applicant's arguments with respect to claims 17 and 19, 20, 22-35 have been considered but are moot in view of the new ground(s) of rejection.

Applicant further argued that the rejection of claims 17, 19, and 20 under 35 U.S.C. § 103(a) as being unpatentable Burnett in view of CDC. A prima facie case of obviousness has not been established (see the remarks page 9).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Burnett and CDC both teach the sensor to detect vibration of human muscle tissue and where the sensor located in, base on the designer's preference and needs acquiring the desired audio sound quality in the acoustical environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the invention of Burnett by implementing a particular arrangement (such as, the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the first person) as claimed based on the designer's reference and needs for the purpose of acquiring the desired audio sound quality of the output signal to the listener in the acoustical environment.

Applicant further argued that Burnett does not detect non-audible vibrations "transmitted through flesh of the first person to the sternocleidomastoid muscle"(see remarks page 11, 1st paragraph).

The examiner disagrees. First Burnet discloses a non-acoustic sensor to detect the vibration of human tissue associated with speech(see col. 3 line 50-63). Second Burnet discloses a microphone on a surface of skin over a muscle below a mastoid of the first person (reads on back of neck in broadly interpreted, and see col.5 line 15-25). A person skill in the art knows that sternocleidomastoid muscle is a paired muscle in the superficial layers of the anterior portion of the neck. It acts to flex and rotate the head.

It also acts as an accessory muscle of inspiration, along with the scalene muscles of the neck.

Therefore, the sensor taught by Burnett is a first person placed in a back of neck to detect vibrations non-audible to the second person, which related to transmitting through flesh of the first person to the sternocleidomastoid muscle and conducted through the skin.

Applicant further argued that CDC dose not teach "detect vibrations non-audible to the second person, which are transmitted through flesh of the first person to the sternocleidomastoid muscle and conducted through the skin"(see the remarks page 12 2nd paragraph).

The examiner disagrees that CDC discloses a sensor efficiency of electrical activity as a physiological measure of the functional state of muscle tissue (page 79 left hand 3rd paragraph) and the measuring of CDC electrodes measure electrical potentials generated by muscle cells based on electromyography signals and CDC discloses surface electromyography (EMG) is a technique whereby voltage-measuring electrodes attached to the surface of the skin are used to detect and/or infer various phenomenal relating to muscular contractions." (Page vi, first paragraph). Moreover, on pages 27 and 28, and Figures 3-4A-F and 3-5A-P, CDC discloses various positions in which a audio signal measuring electrode is attached to the surface of the skin. Position B in Figures 3-5 of CDC, constitutes a muscle extending from the backside of an ear to a lower side of laryngeal prominence, and position C indicates a muscle extending from the backside of the neck to the right shoulder. Positions B and C of CDC. A person skill

in the art knows that sternocleidomastoid muscle is a paired muscle in the superficial layers of the anterior portion of the neck. It acts to flex and rotate the head.
It also acts as an accessory muscle of inspiration, along with the scalene muscles of the neck. Therefore, CDC discloses the microphone(see fig. 1-1(EMG)) on a surface of skin over a sternocleidomastoid muscle below a mastoid of the first person so as to detect vibrations non-audible to the second person, which are transmitted through flesh of the first person to the sternocleidomastoid muscle and conducted through the skin (see figs 3-5 (B, C), figs 7-5, 7-6 and pages 12-14, page 24-26, pages 35-36). The combination meets the claim 17.

Independent claim 19, though of different scope from claim 17, recites features similar to those of claim 17 and is thus also rejected over Burnett and CDC for reasons similar to those presented above for claim 17. Claims 20, 23, and 35 depend from one of the independent claims are thus also rejected over Burnett and CDC by virtue of their dependency.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kazama (US PAT. 4,776,426) is cited to show other related microphone and communication interface system.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (571) 272-7501. The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao, Lun-See
/Lun-See Lao/
Examiner, Art Unit 2614
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 04-07-2010

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614